CHARGE NUMBER: 2501

PROGRAM TITLE: Nuclear and Radiochemistry of Smoke

PROGRAM LEADER: Roger A. Comes

PERIOD COVERED: July 1 - July 31, 1980

DATE OF REPORT: August 4, 1980

I. Puff Spreading[1]

Experiments are underway directed toward the potential enhancement of flavor response by the smoker while maintaining the lowest practical chemical concentration level. It has been assumed by some P.M. researchers that, if a flavor can be enriched in the early part of a puff, the subjective response to the smoker will be at its highest. The latter part of the puff could then contain less of the flavor. This assumption is being investigated by the use of a puff-spreader device. Initial experiments are being conducted to determine the individual total carbon contributions within a single puff by each individual ingredient in the 2R1 cigarette. These individual carbon contributions will then be combined to produce the total carbon smoke profile during a puff. The effect of puff number will also be determined. This total carbon profile will then be used to ratio data on individual smoke component profiles and to study these results in light of changing cigarette designs.

II. Glanded vs Glandless Tobacco[2]

Initial runs to determine the soluble ^{210}Po content of the WSC from the glanded and glandless tobaccos have been completed. The activity on a pCi/gWSC basis is within the range we have found previously for most WSC's. A 20-25% reduction in ^{210}Po activity is noted in these runs for the glandless tobacco WSC. This data will be verified by additional determinations. Future work will involve activity determinations on the filler from the cigarettes from which this WSC was derived.

III. Greenhouse[3,4,5]

a. The sixth ^{14}C-tobacco run was started on 7/15/80 in the large plant growth chamber system in the greenhouse. Four plants of Coker 411 bright tobacco are currently being grown to replenish our supply of ^{14}C-bright tobacco for use in labelled cigarette smoke studies.

b. A literature search on hydroponics as related to tobacco culture has been completed in anticipation of future greenhouse work which may entail growing tobacco by this procedure. (Acc. # 80-201, "Recommendations for Hydroponic Culture of Tobacco at Philip Morris for Ca-45 Study" by E. A. DuRant)

In addition, calcium analyses have been obtained for greenhouse grown tobacco:

	% Calcium	
	Bright-Coker 411	Burley-Ky.10
Top Leaf	1.7%	1.1%
Stem	1.6	0.6
Middle Leaf	2.3	1.8
Stem	1.3	1.3
Bottom Leaf	3.7	4.0
Stem	1.1	1.5

The results on the bright leaf are in line with literature data. The burley data appears low when compared to field grown burley leaf (approx 8%).

c. Tobacco plant materials were provided as requested for Project 1901, Manufacturing Center Reception area, and the Electrical Engineering Services Group.

IV. Miscellaneous[6,7,8]

a. Instrument maintenance - Efforts are underway to provide five complete counting systems for the gas chromatographs for Projects 2501 and 2525. Currently three complete systems are operational.

V. References

1. R. Newman, R. W. Jenkins NB 6549
2. K. Barlow NB 7547
3. R. Bass NB 7296
4. G. Newell NB 7295
5. A. DuRant NB 7435
6. B. Francis NB 7486
7. A. Frisch NB 7309
8. G. Segura NB 7502